

REMARKS

The last Office Action of December 13, 2005 has been carefully considered. Reconsideration of the instant application in view of the foregoing amendments and the following remarks is respectfully requested.

Claims 1-44 are pending in the application. Claim 1 has been amended. No claims have been canceled or added. Amendments to the specification have been made. No fee is due.

It is noted that claims 1-44 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1-44 are also rejected under 35 U.S.C. §112, first paragraph, for failing to provide an adequate written description of the invention and for failing to provide an enabling disclosure.

REJECTION OF CLAIMS 1-44 UNDER 35 U.S.C. §112, SECOND PARAGRAPH

Applicant has amended claim 1 to address the §112 rejection. These changes are self-explanatory and cosmetic in nature and should not be considered as a narrowing amendment to trigger prosecution history estoppel.

More specifically, the confusion with respect to the particulars regarding the thermal expansion coefficient is based on a typographic error as the multiplication sign has inadvertently shifted downwards. It is however generally known to the artisan that the unit for the coefficient of thermal expansion is " 10^6 K^{-1} ". Reference is made, for example, to col. 5 and 6 of U.S. Pat. No. 6,186,768, cited by the Examiner.

The term "conductivity" has been clarified in claim 1 by adding --thermal-- . Support therefore can be found throughout the instant specification, see paragraph [0019], line 5, or the reference to "heat conductivity" in paragraphs [0016] to [0019].

The term "volume mass is a definite term in the art and is equivalent to the term "density". Reference is made, for example, to McGraw-Hill Dictionary of

Scientific and Technical Terms, fifth ed., 1994, page 541 (copy enclosed), where the term "density" is defined as "[T]he mass of a given substance per unit volume.". Claim 1 has been amended however by replacing "volume mass" with --density--.

The specification has been amended to make it consistent with the changes to claim 1.

It is applicant's contention that the examiner should have easily been in a position to understand the meaning of these terms and to ascertain the concerned inventive feature as contemplated by the inventor.

Withdrawal of the rejection of the claims 1-44 under 35 U.S.C. §112, second paragraph is thus respectfully requested.

REJECTION OF CLAIMS 1-44 UNDER 35 U.S.C. §112, FIRST PARAGRAPH

The rejection under 35 U.S.C. 112, 1st para. is respectfully traversed.

The present invention is directed to a heat dissipating structure which is comprised of a composite having particular characteristics as far as thermal expansion coefficient, volume mass (density), and thermal conductivity are concerned, and a surface layer which is applied onto the composite. A composite is made of a matrix component and a reinforcement component. Depending on the type of matrix component, these composites are referred to as "metal matrix composite", or "polymer matrix composite" or resin matrix component". Their structure is generally known to the artisan. Examples include U.S. Pat. Nos. 6,186,768, 5,492,719, or 5,766,534. Reference is made, e.g., to col. 1, lines 7-17, of U.S. Pat. No., 6,186,768, where the structure of a basic metal matrix composite is described.

A novel and inventive feature of the heat dissipating structure according to the present invention resides in the combination of a matrix composite and an additional metallic surface layer. Reference is made to paragraph [0010] of the instant specification.

It is well established that the specification is not required to teach every detail of the invention or to be a production specification. It is only necessary to draft the specification in such a manner that a person skilled in the art is able to make and use the invention, without requiring an inordinate amount of experimentation. In this connection, reference is made to the decision In re Geerdes, 180 USPQ 789 (CCPA, 1974) which discussed the question of "undue experimentation". In Geerdes, the invention involved was a method of producing expanded or foamed polymer compositions without using standard blowing agents. The method milled particles of a polymer together with submicron particles of an additive material having advantageous properties. The Examiner rejected, and the Board affirmed a rejection of the claims and the specification under Section 112, first paragraph, i.a. that the invention was not enabling because experimentation would be required to determine proportions and particle sizes. On appeal, the CCPA reversed. As pointed out by the Court, the fact that some experimentation may be required is not determinative of the enablement requirement under Section 112, first paragraph. Thus, Geerdes instructs that a patent application is enabled even if some experimentation is required to make and use the invention.

In the case at hand, a person skilled in the art knowing the individual ingredients for the heat dissipating structure, namely a) a matrix component of metal, polymer or resin, b) a reinforcement component which contains microfibers and nanofibers, and c) a surface layer with metallic character, would be able to make and use the invention, even though the specification lacks a specific and complete working example. Section 112, first paragraph does not require or mandate that a specific example be disclosed so long the specification is disclosed in such manner as to enable a person skilled in the art to practice the invention without undue experimentation. In re Borkowski, 164 USPQ at 645.

The examples provided in the instant specification on pages 12-14 are illustrative for the type of fibers used in the reinforcement component. A person skilled in the art is well aware as to the procedure to make a matrix composite, as noted above. ("This court has often observed that minutiae of descriptions or

procedures perfectly obvious to one of ordinary skill and yet unfamiliar to laymen need not be set forth,". *In re Eltgroth*, 419 F.2d 918, 921, 164 USPQ 221, 223 (CCPA 1970)).

It is applicant's belief that the instant specification satisfies the requirement under section 112, first paragraph, and the examiner should have easily been in a position to ascertain the concerned inventive feature as contemplated by the inventor.

Withdrawal of the rejection of the claims 1-44 under 35 U.S.C. §112, first paragraph is thus respectfully requested.

CITED REFERENCES

Applicant has also carefully scrutinized the cited prior art and finds it without any relevance to the pending claims. It is thus felt that no specific discussion thereof is necessary.

PRIORITY

On page 1 of the Office Action, the Examiner failed to acknowledge the receipt of the certified copy of the priority document. Please note that the priority document has been filed together with applicant's original transmittal letter of November 12, 2003. Acknowledgement of receipt of the certified copy is respectfully requested. Should the Examiner be unable to locate any indication that the certified copy of the priority document was filed, the Examiner is requested to advise, and applicant will submit a replacement copy, if necessary.

CONCLUSION

In view of the above presented remarks and amendments, it is respectfully submitted that all claims on file should be considered patentably differentiated over the art and should be allowed.

Reconsideration and allowance of the present application are respectfully requested.

Should the Examiner consider necessary or desirable any formal changes anywhere in the specification, claims and/or drawing, then it is respectfully requested that such changes be made by Examiner's Amendment, if the Examiner feels this would facilitate passage of the case to issuance. If the Examiner feels that it might be helpful in advancing this case by calling the undersigned, applicant would greatly appreciate such a telephone interview.

Respectfully submitted,

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McGraw-Hill Dictionary of Scientific and Technical Terms

Fifth Edition

Sybil P. Parker

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On the cover: Photomicrograph of crystals of vitamin B₁.
(Dennis Kunkel, University of Hawaii)

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In addition, material has been drawn from the following references: R. E. Huschke, *Glossary of Meteorology*, American Meteorological Society, 1959; *U.S. Air Force Glossary of Standardized Terms*, AF Manual 11-1, vol. 1, 1972; *Communications-Electronics Terminology*, AF Manual 11-1, vol. 3, 1970; W. H. Allen, ed., *Dictionary of Technical Terms for Aerospace Use*, 1st ed., National Aeronautics and Space Administration, 1965; J. M. Gilliland, *Solar-Terrestrial Physics: A Glossary of Terms and Abbreviations*, Royal Aircraft Establishment Technical Report 67158, 1967; *Glossary of Air Traffic Control Terms*, Federal Aviation Agency; *A Glossary of Range Terminology*, White Sands Missile Range; New Mexico, National Bureau of Standards, AD 467-424; *A DOD Glossary of Mapping, Charting and Geodetic Terms*, 1st ed., Department of Defense, 1967; P. W. Thrush, comp. and ed., *A Dictionary of Mining, Mineral, and Related Terms*, Bureau of Mines, 1968; *Nuclear Terms: A Glossary*, 2d ed., Atomic Energy Commission; F. Casey, ed., *Compilation of Terms in Information Sciences Technology*, Federal Council for Science and Technology, 1970; *Glossary of Stinfo Terminology*, Office of Aerospace Research, U.S. Air Force, 1963; *Naval Dictionary of Electronic, Technical, and Imperative Terms*, Bureau of Naval Personnel, 1962; *ADP Glossary*, Department of the Navy, NAVSO P-3097.

McGRAW-HILL DICTIONARY OF SCIENTIFIC AND TECHNICAL TERMS, Fifth Edition

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by its length, equal to 1 gram for 9000 meters of fiber. { 'den-yər }

denim [TEXT] A sturdy twill-weave cotton fabric having a solid-colored warp and a white filling. { 'den-əm }

Denison sampler [ENG] A soil sampler consisting of a central nonrotating barrel which is forced into the soil as friction is removed by a rotating external barrel; the bottom can be closed to retain the sample during withdrawal. { 'den-ə-sən ,səm-plər }

Denisyuk hologram [OPTICS] A type of hologram that can be viewed in ordinary white light through use of the depth dimension of the emulsion. { 'den-ə-syūk 'hāl-ə,gram }

denitration [CHEM] Removal of nitrates or nitrogen. Also known as denitrification. { dē,nī'trā-shən }

denitrification [CHEM] See denitration. [MICROBIO] The reduction of nitrate or nitrite to gaseous products such as nitrogen, nitrous oxide, and nitric oxide; brought about by denitrifying bacteria. { dē,nī'trə-fā'kā-shən }

denitrifying bacteria [MICROBIO] Bacteria that reduce nitrates to nitrites or nitrogen gas; most are found in soil. { dē'nī-trī-fīŋ bak'tīrē-ə }

denitrogenate [PHYSIO] To remove nitrogen from the body by breathing nitrogen-free gas. { dē'nī'trə-jə,nāt }

denominator [MATH] In a fraction, the term that divides the other term (called the numerator), and is written below the line. { (dē'nām-ə,nād-ər }

De Nora cell [CHEM ENG] Mercury-cathode cell used for production of chlorine and caustic soda by electrolysis of sodium chloride brine. { dē'nō-rə ,sel }

dense [GRAPHICS] Very opaque because of a concentration of material, as pertaining to a negative or transparency that has been overdeveloped or overexposed. { dens }

dense-air refrigeration cycle See reverse Brayton cycle. { 'dens ,er,rī,fri-jə'rā-shən ,sī-kəl }

dense-air system See cold-air machine. { 'dens ,er,sis-təm }

dense binary code [COMPUT SCI] A code in which all possible states of the binary pattern are used. { 'dens ,bī'n-ərē ,kōd }

dense connective tissue [HISTOL] A fibrous connective tissue with an abundance of enlarged collagenous fibers which tend to crowd out the cells and ground substance. { 'dens ,kōn-ek-tīv ,tīsh-yū }

dense fibrillar component [CYTOL] A component of the nucleolus that lacks granules and stains more intensely than other nucleolar components. { 'dens ,fī-br-ə-lər kām,pōn-ənt }

dense-in-itself set [MATH] A set every point of which is an accumulation point; a set without any isolated points. { 'dens ,in-it-self ,set }

dense list [COMPUT SCI] A list in which all the cells contain records of the file. { 'dens ,list }

dense-media separator [MIN ENG] A device in which a heavy mineral is dispersed in water, causing heavier ores to sink and lighter ores to float. { 'dens ,mēd-ē-ə ,sep-ə,rād-ər }

dense subset [MATH] A subset of a topological space whose closure is the entire space. { 'dens ,səb ,set }

densify [ENG] To increase the density of a material such as wood by subjecting it to pressure or impregnating it with another material. { 'den-sə ,fī }

densimeter [ENG] An instrument which measures the density or specific gravity of a liquid, gas, or solid. Also known as densitometer; density gage; density indicator; gravitometer. { 'den-sim-ə-tər }

densitometer [ENG] 1. An instrument which measures optical density by measuring the intensity of transmitted or reflected light used to measure photographic density. 2. See densimeter. { 'den-sim-ə-tər }

density [MATH] Closeness of texture or consistency. Lower bound of an increasing sequence of integers, the greatest lower bound of the quantity $F(n)/n$, where $F(n)$ is the number of integers in the sequence (other than zero) equal to or less than n . { 'dens-ə-tē }

density [PHYS] The mass of a given substance per unit volume. The common logarithm of opacity. [PHYS] The total amount of a quantity, such as energy, per unit of space. { 'den-səd-ē }

density airspeed [AERO ENG] Calibrated airspeed corrected for pressure altitude and true air temperature. { 'den-səd-ē ,ā-spi-d ,fā-t }

density altitude [METEOROL] The altitude, in the standard

atmosphere, at which a given density occurs. { 'den-səd-ē 'al-tə,tūd }

density bombing [ORD] Dropping a given tonnage of bombs onto an area in order to make certain of striking particular targets. { 'den-səd-ē ,bām-ŋ }

density bottle See specific gravity bottle. { 'den-səd-ē ,bād-əl }

density channel [METEOROL] A channel used to investigate a density current; for example, in experiments relating to the behavior of cold masses of air in the atmosphere and related frontal structures. { 'den-səd-ē ,chan-əl }

density correction [AERO ENG] A correction made necessary because the airspeed indicator is calibrated only for standard air pressure; it is applied to equivalent airspeed to obtain true airspeed, or to calibrated airspeed to obtain density airspeed. [ENG] 1. The part of the temperature correction of a mercury barometer which is necessitated by the variation of the density of mercury with temperature. 2. The correction, applied to the indications of a pressure-tube anemometer or pressure-plate anemometer, which is necessitated by the variation of air density with temperature. { 'den-səd-ē kō'rek-shən }

density current [METEOROL] Intrusion of a dense air mass beneath a lighter air mass; the usage applies to cold fronts. [OCEANOGR] See turbidity current. { 'den-səd-ē ,kōr-ənt }

density-dependent factor [ECOL] A factor that affects the birth rate or mortality rate of a population in ways varying with the population density. { 'den-səd-ē ,dī-pen-dənt ,fak-tər }

density effect [NUCLEO] The reduction in the stopping power of dense materials for relativistic particles that is caused by the reduction of the effective electric field of the particles by the polarization of adjacent atoms. { 'den-səd-ē ,i,fekt }

density error [AERO ENG] The error in the indications of a differential-pressure-type airspeed indicator due to nonstandard atmospheric density. { 'den-səd-ē ,er-ər }

density function [MATH] A density function for a measure m is a function which gives rise to m when it is integrated with respect to some other specified measure. [STAT] See probability density function. { 'den-səd-ē ,fəŋk-shən }

density gage See densimeter. { 'den-səd-ē ,gāj }

density gradient centrifugation [ANALY CHEM] Separation of particles according to density by employing a gradient of varying densities; at equilibrium each particle settles in the gradient at a point equal to its density. { 'den-səd-ē ,grād-ē-ənt sen, trif-ə'gā-shən }

density-independent factor [ECOL] A factor that affects the birth rate or mortality rate of a population in ways that are independent of the population density. { 'den-səd-ē ,in-dē ,pen-dənt ,fak-tər }

density indicator See densimeter. { 'den-səd-ē ,in-dē ,kād-ər }

density log [PETRO ENG] Radioactivity logging of reservoir structure densities down an oil-well bore by emission and detection of gamma rays. { 'den-səd-ē ,lāg }

density matrix [QUANT MECH] A matrix ρ_{mn} describing an ensemble of quantum-mechanical systems in a representation based on an orthonormal set of functions ϕ_n ; for any operator G with representation G_{mn} , the ensemble average of the expectation value of G is the trace of ρG . { 'den-səd-ē ,mā-triks }

density modulation [ELECTR] Modulation of an electron beam by making the density of the electrons in the beam vary with time. { 'den-səd-ē ,māj-ə'lā-shən }

density of states [SOLID STATE] A function of energy E equal to the number of quantum states in the energy range between E and $E + dE$ divided by the product of dE and the volume of the substance. { 'den-səd-ē əv 'stāts }

density packing [COMPUT SCI] In computers, the number of binary digit magnetic pulses stored on tape or drum per linear inch on a single track by a single head. { 'den-səd-ē ,pak-ŋ }

density ratio [METEOROL] The ratio of the density of the air at a given altitude to the air density at the same altitude in a standard atmosphere. { 'den-səd-ē ,rā-shō }

density rule [ENG] A grading system for lumber based on the width of annual rings. { 'den-səd-ē ,rūl }

density scale [GRAPHICS] A value for the range density for a photographic material that corresponds to the difference between the maximum density and the minimum density. Also known as net density. { 'den-səd-ē ,skāl }

density specific impulse [AERO ENG] The product of the specific impulse of a propellant combination and the average specific gravity of the propellants. { 'den-səd-ē ,spə'sif-ik 'im,pəls }